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**IN THE CLAIMS:**

Please amend claims 1, 11, 21 and 22. Please introduce new claims 23 and 24.

A clean version of the claims as amended are listed below. An annotated version of the claims indicating the amendments made herein are attached hereto as **Exhibit A**.

1. (AMENDED) A method of producing an improved organism having a desirable trait, the method comprising:

a) obtaining an initial population of organisms,

b) generating a set of mutagenized organisms, from the initial population, wherein non-stochastic genetic mutations are represented in the set of mutagenized organisms, and

c) identifying the desirable trait exhibited by one of the set of mutagenized organisms, thereby producing the improved organism.

11. (AMENDED) A method of producing an improved organism having a desirable trait, the method comprising:

a) obtaining an initial population of organisms,

b) generating a set of mutagenized organisms from the initial population, each having at least one genetic mutation, wherein non-stochastic genetic mutations are represented in the set of mutagenized organisms,

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- c) detecting the manifestation of at least two genetic mutations which contribute to the desired trait,
  - d) introducing the at least two detected genetic mutations into one organism,
  - and
  - e) optionally repeating any of the steps, thereby producing an improved organism having a desirable trait.
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21. (AMENDED) A method for identifying a gene that alters a trait of an organism, the method comprising:

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- a) obtaining an initial population of organisms,
  - b) generating a set of mutagenized organisms from the initial population of organisms, wherein non-stochastic genetic mutations are represented in the set of mutagenized organisms, and
  - c) identifying a mutagenized organisms exhibiting the altered trait, and
  - d) determining the nucleotide sequence of a gene having the genetic mutation in the organism identified in step (c), thereby identifying the gene that alters the trait of the organism.

22. (AMENDED) A method for producing an organism with an improved trait, the method comprising:

a) functionally knocking out an endogenous gene in a substantially clonal population of organisms;

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b) transferring a library of altered genes into the substantially clonal population of organisms, wherein each altered gene differs from the endogenous gene at only one codon to produce a population of mutagenized organisms;

c) detecting a mutagenized organism having an improved trait, thereby producing an organism with an improved trait.

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23. (NEW) The method of any one of claims 1, 11, 21 or 22, wherein the trait is selected from the group of: an ability to produce a substance, an ability to not produce a substance, an increased ability to produce a substance, a decreased ability to produce a substance, viability under pre-defined conditions, non-viability under pre-defined conditions, altered behavior, change in growth rate, change in size, change in morphology, an alteration in a morphological characteristic, and any combination thereof.

24. (NEW) The method of any one of claims 1, 11, 21 or 22, wherein the improved trait comprises differential activation of selected inactive gene products in the organism.

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